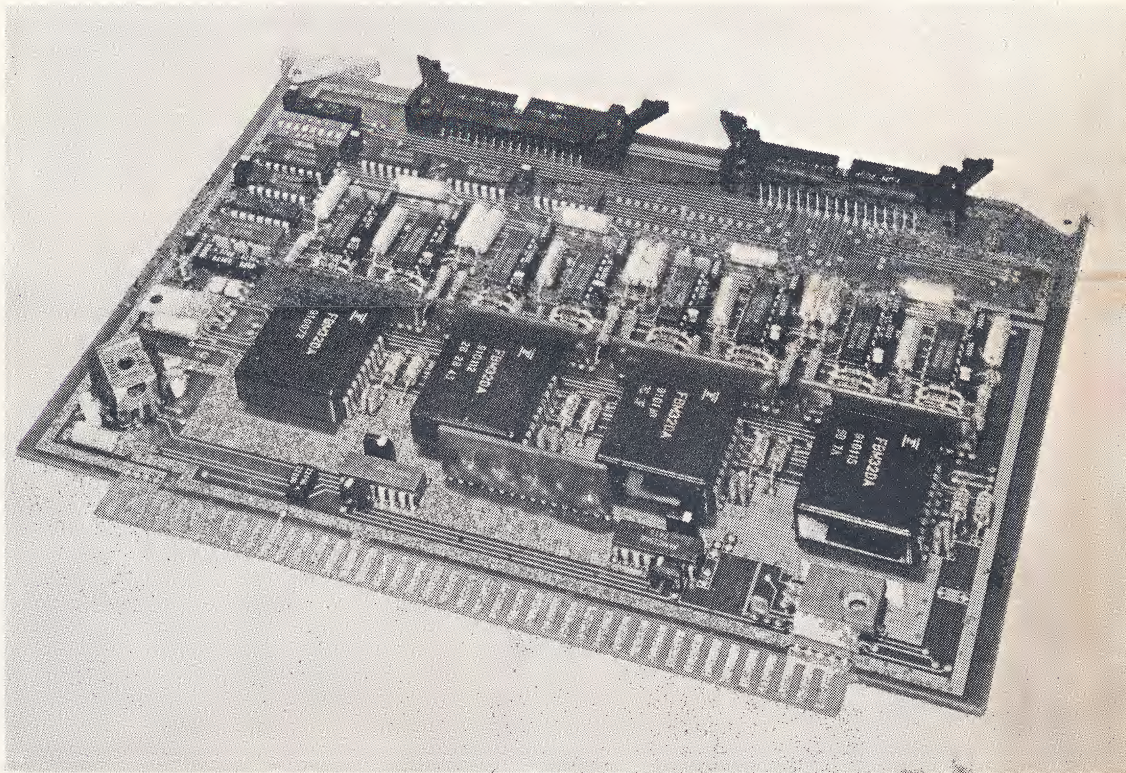


FUJITSU

FUJITSU BUBBLE MEMORY

May 80
→ bus or specified



Fujitsu Bubble Memory Cards are designed to provide high performance, non-volatile memories.

Many features such as large storage capacity, low access time, easy interfacing and compactness make these memory units ideal for use in computers and various memory equipments.

Fujitsu Bubble Memory Cards FBC304M1A and FBC304D2A are TTL compatible 32K-byte memory units providing a quarter million bits of readable/writable, non-volatile memory.

The FBC304M1A has four 74K-bit **serial loop** organized Bubble Memory Devices (FBM31DB).

The FBC304D2A has four 83K-bit **major/minor loop** organized Bubble Memory Device (FBM32DA).

Both Memory Cards contain coil drivers, function drivers, sense circuit and other circuitry needed for operation. For greater versatility and increased capacity, several Memory Cards may be connected to the customer interface.

Being all solid state units without any moving parts, these Memory Cards feature high reliability, low power consumption and no routine maintenance.

Features

- Non-volatile
- Large storage capacity
- Low power consumption
- All solid state
- High reliability

Applications

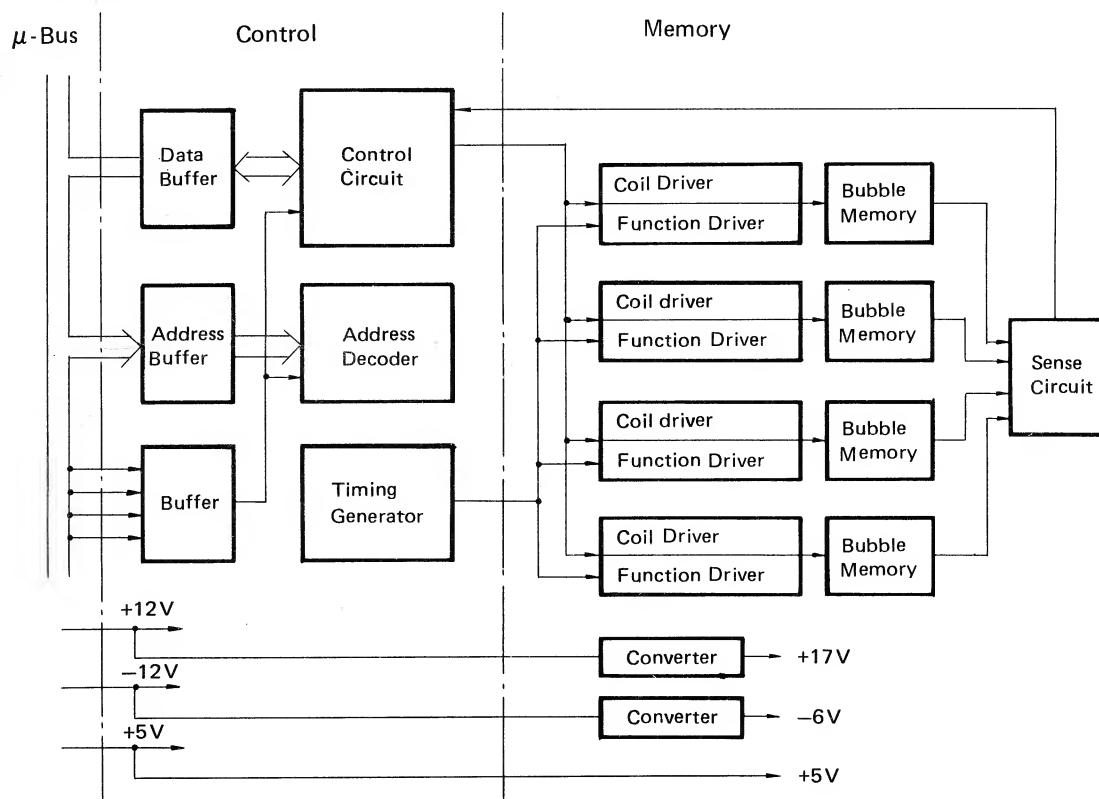
- Replaces disk, drum and tape
- File memory for micro-computer and mini-computer
- Program loaders for testing equipment and numerical control systems

FUJITSU 32K-BYTE BUBBLE MEMORY CARDS

ENGINEERING DATA

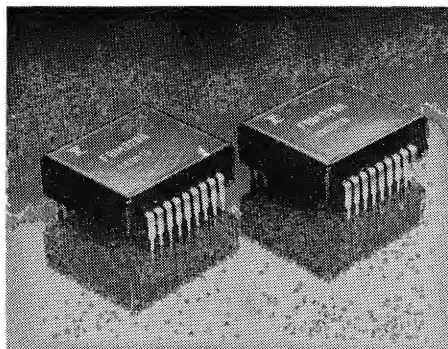
	FBC304M1A	FBC304D2A
Devices:	FBM31DB	FBM32DA
Number of Devices:	4	4
Organization:	Serial loop	Major/Minor loop
Capacity:	296,128 bits	324,024 bits
Average Access Time:	370 ms	4.5 ms
Drive Frequency:	100 kHz	100 kHz
Data Rate:	100K bits/sec.	200K bits/sec.
Interface:	TTL Compatible	TTL Compatible
Power Consumption		
Operating:	9 W	11 W
Stand-by:	6 W	2.5 W
Power Requirement:	+ 12 V (± 5 %)	+ 12 V (± 5 %)
	− 12 V (± 5 %)	− 12 V (± 5 %)
	+ 5 V (± 5 %)	+ 5 V (± 5 %)
Temperature Range		
Operating:	0°C to + 50°C	0°C to + 50°C
Non-volatile Storage:	−40°C to +85°C	−40°C to +85°C

BLOCK DIAGRAM



Note: Above diagram is of FBC304M1A with four FBM31DB memory devices. The FBC304D2A Controller portion is on the other card (FBC304C2A).

FUJITSU BUBBLE MEMORY DEVICES



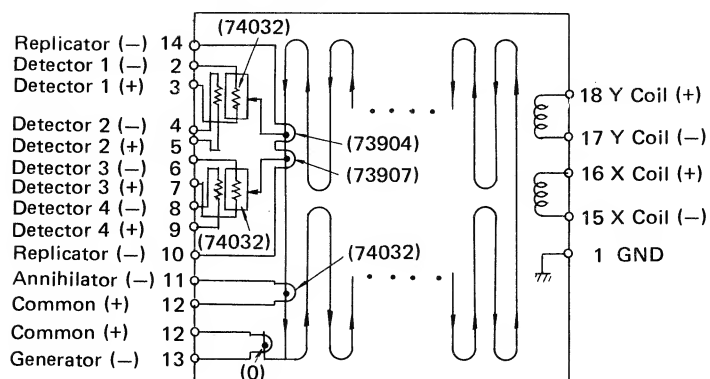
- HEART OF FUJITSU BUBBLE MEMROY CARDS
- LARGE STORAGE CAPACITY
- NON-VOLATILE
- 100 kHz OPERATION AND DATA OUTPUT
- LOW POWER CONSUMPTION
- 18-PIN DUAL IN-LINE PACKAGE
- **MAJOR/MINOR LOOP AND SERIAL LOOP** ORGANIZATION AVAILABLE

ENGINEERING DATA

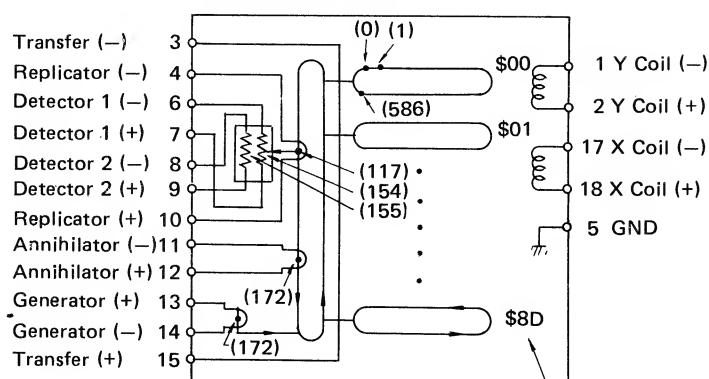
	FBM31DB	FBM32DA
Capacity:	74,032 bits	83,354 bits (total) 81,006 bits (effective)
Organization:	Serial loop	Major/Minor loop
Drive Frequency:	100 kHz	100 kHz
Average Access Time:	370 ms	4.5 ms
Power Consumption:	500 mW	500 mW
Temperature Range		
Operating:	0 °C to + 55 °C	0 °C to + 55 °C
Non-volatile Storage:	- 40 °C to + 85 °C	- 40 °C to + 85 °C
External Magnetic Field		
Operating:	50 Oe	50 Oe
Non-volatile Storage:	100 Oe	100 Oe

CIRCUIT DIAGRAM

- FBM31DB
(Serial loop)

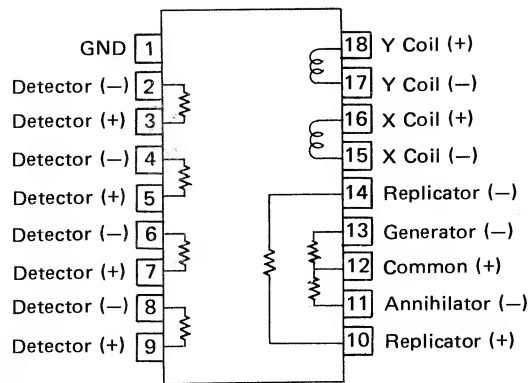


- FBM32DA
(Major/Minor loop)

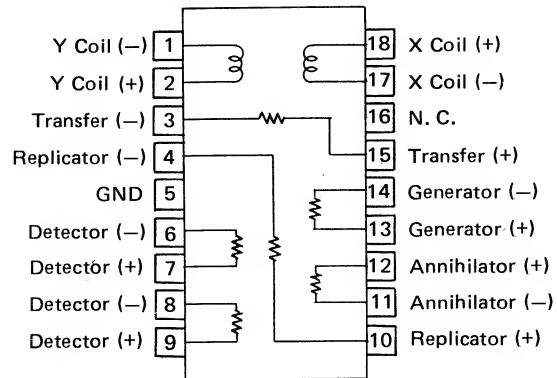


Hexadecimal code

• FBM31DB
(Serial loop)



• FBM32DA
(Major/Minor loop)



DIMENSIONS

Unit: mm (inch)

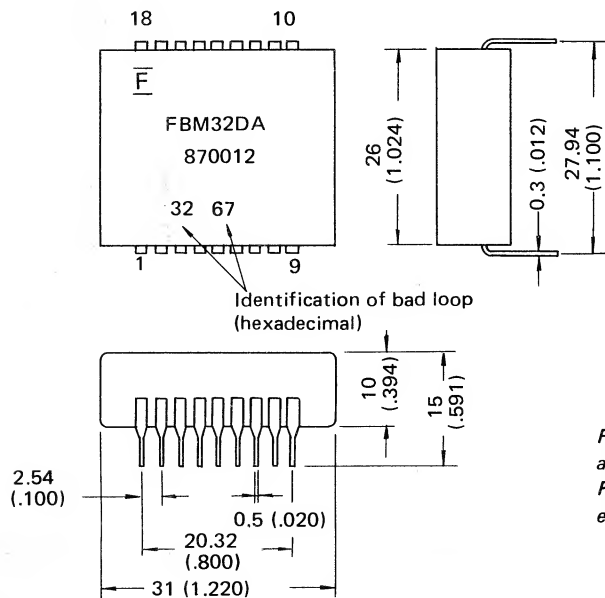


Figure shows FBM32DA
as an example.
FBM31DB is also same
except the marking.



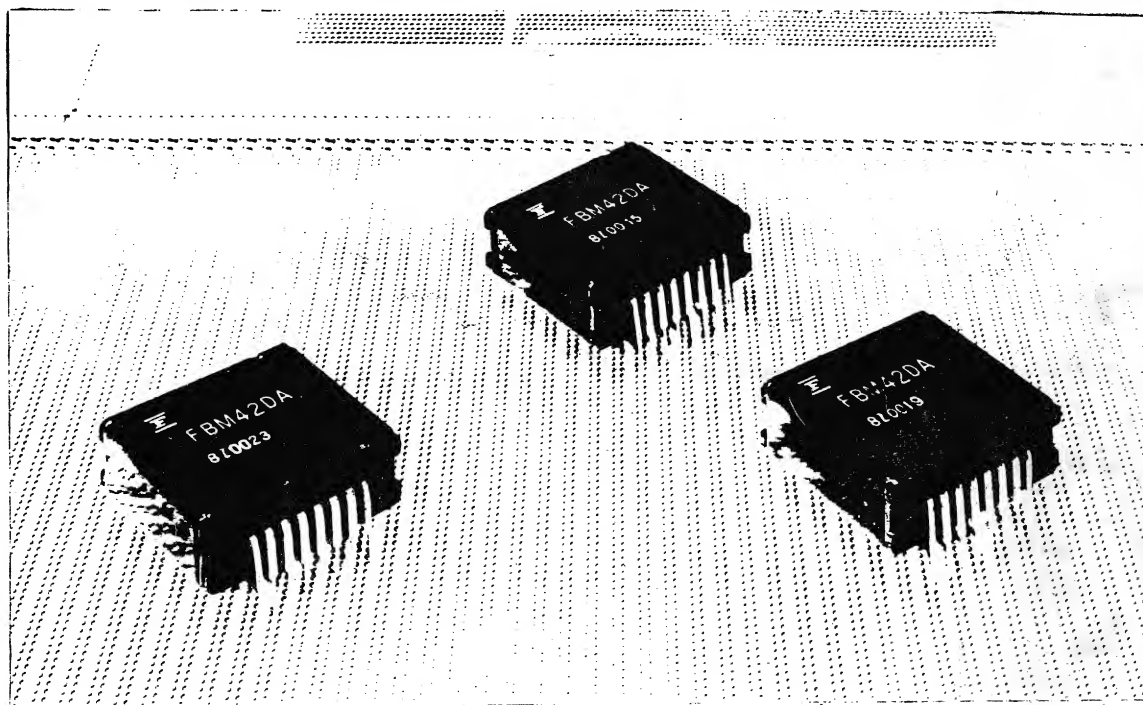
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FUJITSU BUBBLE MEMORY 256K-BIT MEMORY DEVICE FBM 42DA



The Fujitsu Bubble Memory Device FBM42DA is a 16-pin dual in-line package containing a 256 K-bit bubble memory chip, rotating magnetic field drive coils and permanent magnets to provide the required static magnetic field. They are encapsulated in plastic and packaged in a magnetic shielding outer case.

FEATURES

- High storage capacity
- Non-volatile memory
- Low power consumption
- High reliability
- 16-Pin dual in-line package

APPLICATIONS

- Replaces disk, drum and tape
- File memory for micro-computer and mini-computer
- Program loaders for testing equipments and numerical control systems

ENGINEERING DATA

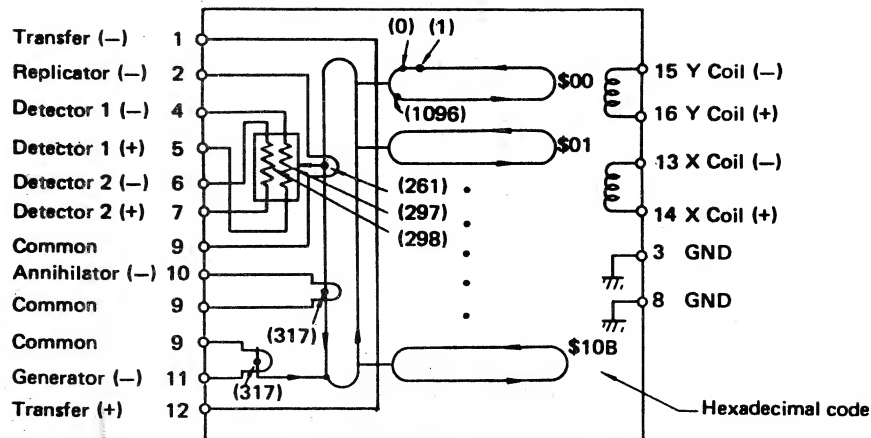
Capacity:	293,996 bits (total) 283,026 bits (effective)	Chip organization:	Major/minor loop
Drive frequency:	100 kHz	Minor loop count:	268 (total) 258 (effective)
Average access time:	8.5 ms	Minor loop length:	1,097 positions
Power consumption:	670 mW	Major loop length:	1,096 positions
Temperature range			
Operating:	0 °C to + 55 °C		
Non-volatile storage:	- 40 °C to + 85 °C		

Jun. 1979(II)

Contents of this paper may be revised without notice.

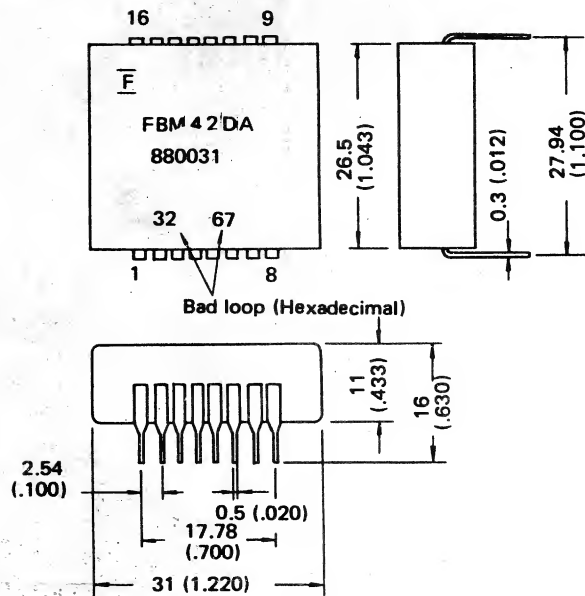
FUJITSU LIMITED
Communications and Electronics

CIRCUIT DIAGRAM

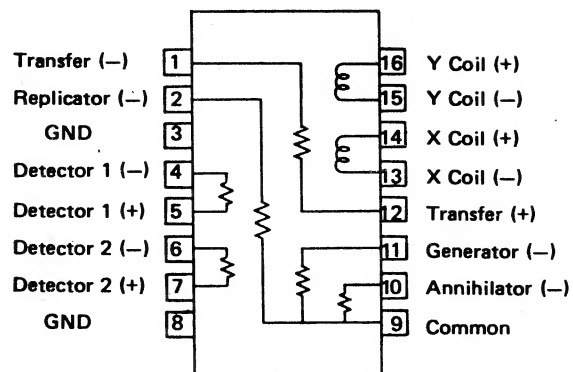


DIMENSIONS

Unit: mm (inch)



PIN ASSIGNMENT



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6-1, Marunouchi 2-chome, Chiyoda-ku, Tokyo 100, Japan Cable: "FUJITSULIMITED TOKYO" Telephone: (Tokyo) 03-216-3211 Telex: (Tokyo) J22833

For further information please contact:

FUJITSU LIMITED

Components Group:
(Head Office)
Paris Liaison Office:
Singapore Branch:

Syowa Onarimon Bldg., 1-1, Shinbashi 6-chome, Minato-ku, Tokyo 105, Japan
phone: 03-437-2111 cable: FUJITSULIMITED TOKYO telex: 2424511 FT SIN J
Porte No. 207, 1 Voie, Felix, Eboue 94000 Creteil, France phone: 01-898-0355 telex: 212544
No. 2, Second Chin Bee Road, Jurong Town P.O. Box 223, Singapore 22.
phone: 656511 telex: FUJISIN RS22194

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